WATERSHED ASSESSMENT
FOR THE
MUDLICK RUN WATERSHED

HARDY COUNTY, WEST VIRGINIA

SUBDRAINAGE OF
HYDROLOGIC UNIT 02070001070

PREPARED BY:

USDA NATURAL RESOURCES CONSERVATION SERVICE

IN COOPERATION WITH

WV SOIL CONSERVATION AGENCY
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TABLE OF CONTENTS

Introduction

Mudlick Run Watershed is located in the northwest corner of Hardy County, West Virginia. The western boundary of the watershed follows the Hardy/Grant County line. Mudlick Run watershed is composed of four primary tributaries. Anderson Run is the largest tributary and is composed of Walnut Bottom Run, Tombs Hollow, and Long Hollow. Anderson Run joins Mudlick Run approximately one mile east of the South Branch of the Potomac. Turnmill Run is located in the center of the watershed and drains directly into Mudlick about 300 feet downstream from a bridge on Route 220, three miles north of Old Fields. Mudlick Run itself is located at the northern tip of the watershed boundaries and collects drainage from approximately 50% of the watershed.

Mudlick watershed encompasses 25,391 acres or about 40 square miles. Elevations on the western boundary along the top of Patterson Creek Mountain are about 2600' above mean sea level (MSL), dropping to about 1200' above MSL in the shale ridges to the east, and down to 750' above MSL on the flood plain at the confluence of Mudlick Run and the South Branch of the Potomac River.

This document represents a cursory assessment at the watershed level that will highlight problems and opportunities for further work. It will serve as a foundation document that can be used and supplemented to seek funds of all types from federal, state, local, or private sources.

Social Characteristics

Population

Population in this watershed is estimated at 800 people. This estimate was based on the number of buildings indicated on the topographic maps. Census population from 1990 indicates that 2,269 persons reside in the Old Fields Civil Division of Hardy County and this division encompasses substantially more area that just the three watersheds. There are no large towns in watersheds. The county seat of Hardy County, Moorefield, is the nearest town and has a population of 2,257 persons. Population in Moorefield has decreased by five percent since 1980. Population outside the city limits of Moorefield has increased about 10 percent since 1980, making Hardy County one of the few growing counties in West Virginia. Statewide, there has been a decline in population by about eight percent.

Employment

Employment information for Hardy County and Moorefield was used to reflect conditions in the watersheds. The labor force in Hardy County has grown from 4,860 persons in 1980 to 6,940 in 1997, reflecting the strong economy in the area. Major employers include manufacturing jobs, construction, and agriculture. Government, utilities, and service occupations employ about half the available labor force. The unemployment rate in Hardy County was 4.6 percent in March 1999 compared to the state unemployment rate of 7.4 percent and the national rate of 4.4 percent.

Income

Income levels for Hardy County and for Moorefield were used to estimate income levels in the watershed. Per capita income for Hardy County was $17,546 in 1996 which is slightly lower than the state per capita income of $18,225 and the national statistic of $24,436. While the economy is strong in Hardy County and the unemployment is low, wages continue to be low as well. About 15 percent of all persons in Hardy County are below the poverty line, compared to 19.6 percent statewide.

Land Use

Dominant soil types for the watershed are Berks - Weikert shaley loam and DeKalb, Hazelton, LeHew stony loam complexes in uplands, making up 34% of the watershed. The common colluvial soils on footslopes and at the head of drainageways are Clarksburg and Ernest silt loam, about 8% of the land mass in the watershed. Prominent soils on flood plains include Huntington, Monongahela, and Tioga silt loams. Woodland is the predominant land use.

Many of the shale-derived soils in the watershed are suited for pastureland but have a high potential for erosion when overgrazed. Cattle are the common species for pasture utilization. The following table illustrates the land distribution for the watershed:

Land Use	Watershed Percentage	Acres
Woodland	64	16,290
Pastureland	26	6,712
Cropland	8	1,896
Miscellaneous	2	493
* = Roads, Urban, Water	**Total** = 100	25,391

Urban

Only one urban area exists in this watershed. The town of Old Field, WV contains approximately 15 houses and a day care center. The rest of the watershed consists of rural property owners. Three small subdivisions exist in the area. Current development activity is minimal. Septic tanks are the common waste disposal systems in use in the watershed.

Mining

This watershed currently has no mining activities. This area is largely composed of shale and limestone rock. The shale is used for access roads for farms and houses and as foundation material for buildings. While this would be considered a mining process, it still is not in enough quantity to be an issue in this report. No shale pits are being mined by a commercial mining operation.

The Fairfax Corporation has recently applied to WVDEP for a permit to open and operate a large limestone quarry in the northern end of the watershed.

Agricultural

Forest

The Mudlick Watershed contains approximately 16,000 acres of woodland. The woodland is all regenerated mixed mesopyhtic forest of pole to saw timber size. Oak Hickory forest type covers 48-49% of the area, with cove hardwoods making up the 6 -7%. The remainder of the watershed is made up of various tree types. Existing stands are comprised mainly of Red Oak, White Oak, Chestnut Oak, Black Oak, Virginia Pine, Ash, Yellow Poplar, and Scarlet Oak.

Site quality for timber growth varies depending on soil type, but averages are in the 3,000 board feet per acre range. A small portion of the watershed with Elliber and Dekalb-Lewhew soils has a site index exceeding 60, making the area good or very good for tree growth. The poorer, drier sites on Berks and Weikert soils generally are covered with mixed oaks and associated species and are usually lower quality.

Most of the forestland is in private ownership. Only a small percentage is under management for timber production or for multiple uses. Intermediate cutting is limited. Most timber will be harvested when it reaches maturity. There have been approximately 750 acres harvested in last 2 years, 1,669 in the last 5 years, and 2,139 in the last 10 years. Most of the timber goes to local sawmills in the watershed. Gypsy moths are presently not a problem in stand growth.

Pasture

Pastureland in the watershed has an average slope of 15-20%. Most of the grazing lands are in the higher elevations of the watershed and are not rotational grazed. Pasture fields range in size from 5 to 300 acres. Many large fields exist with unimproved watering systems or divisional fencing. Ground cover for pastures averages 65%, with the common species being fescue, orchard grass, bluegrass, red and white clover. Much of the land is subject to excessive erosion due to inadequate vegetative cover. This is due to steep slopes, shaley soils, poor fertility, and in some cases, excessive stocking rates.

Fields that can be covered by tractor equipment are fertilized using litter from the local poultry growers. About 75% of treatable pastureland has litter applied once every year. The pH of this soil ranges from 5.0 - 5.5. Lime is applied once every 6-10 years. Soil tests are taken an average of every five years for those who utilize this service.

Cropland

Approximately 1,897 acres of the Mudlick watershed is in crop production. Of this acreage, approximately 75% is in hay and 25% in corn silage or grain. The most common soil types for corn production are: Huntington, Monongahela, and Tioga. The average production for these soils is 120 bushels per acre. Most of the cornfields are no tilled or are in a grass rotation to reduce erosion. Improved field borders and riparian buffers are needed along some of the flood plain crop fields to filter surface runoff.

Hayland is dominant on gently rolling hills in this region. Approximately 40% of the hay is harvested as first cut then the fields are used as pasture during the summer slumps of forage production.

Poultry litter is the predominant source of soil nutrient additives for crop ground. Most of the corn producers are enrolled in the PL-534 programs and have nutrient management plans for litter application. The PL-534 program requires soil test be taken every three years. Lime is applied based on soil test recommendations.

Agricultural Waste

This area of the county consists of rolling hills and steep mountain terrain. Most feedlots and poultry houses are located near the residence for ease of feeding and management. In 1996 an inventory of the area was completed by the Potomac Water Quality office. At that time, a total of 55 animal production areas were identified as follows:

Cattle	Feedlots	**10**
Poultry	Breeders	**22**
Poultry	Broilers	**17**
Poultry	Pullets	**6**
	Totals =	**55**

Since that time the poultry industry has expanded in the watershed. Based on a total of 45 poultry houses producing 477,750 birds an estimated 7,050 tons of litter are generated. Currently the PL-534 program has assisted 6 producers in building a litter shed or composter. It is estimated that less than 25% of the litter produced in this watershed is removed from the area. However, an unknown amount of litter is being brought into the watershed along with other nutrients like sludge from poultry production plants and commercial fertilizers.

It is estimated that half of the feedlots recently cited by WV DEP need improvements to adequately manage animal wastes.

Environmental and Cultural Resources

Fish and Wildlife

The lands and waters of the area provide the habitat for a wide variety of fish and wildlife. The variety results from land use diversity, moderate climate, relatively sparse human population, and limited encroachment. Forestland occupies the majority of the watershed, with the remainder being grassland and open area. Urban land is low, approximately 2% of the total area. The interspersion of forestland, farmland, and other land uses, provides a good habitat mix for wildlife.

Populations of big game animals in the Mudlick Watershed are average. The whitetail deer harvest in Hardy County was 4.28 per square mile of deer range in 1997. This translates to approximately 43 deer per square mile, indicating that the watershed is capable of supporting the deer population that exists in the area. Hardy County's wild turkey harvest in 1997, both spring and fall seasons, totaled 138 birds. The Mudlick watershed offers premium habitat for deer and turkey, and can be considered representative of the overall county populations for these species.

Good populations of small game are also found in the watershed. Cottontail rabbits and gray and fox squirrels are plentiful. Hunting pressure for game animals is moderate throughout the watershed.

The watershed is also home to a variety of passerines, raptors, waterfowl, nongame animals, reptiles, and amphibians. Aquatic habitat in the watershed is limited. In the area of convergence of Mudlick and Anderson Run, larger game fish could survive. The rest of the watershed is small and supports a habitat suitable for minnows.

Threatened and Endangered Species

The threatened bald eagle, *Haliaeetus leucocephalus* is known to nest in the Trough area of the South Branch of the Potomac River, immediately east of the Mudlick Watershed. The bald eagle could occur as a transient in the watershed while seeking food.

Potential summer/maternity habitat for the Indiana Bat *Myotis sodalis* occurs in the area. There are 27 known hibernacula for the Indiana bat spread across the limestone regions of eastern West Virginia. The population of the hibernacula in West Virginia range in size from one to 8,550 Indiana bats. Recent data indicates that the area within an approximate 5.0 mile radius of a hibernaculum is important foraging and roosting habitat for the Indiana bat in the fall swarming period, August 15 through November 15. The watershed is outside of the five mile radius of the nearest hibernaculum.

There is no historic or recent evidence that female Indiana bats utilize any portion of West Virginia for summer maternity range. Therefore, West Virginia has been designated as a non-core area for the bat. However, male Indiana bats are known to occur during the summer in proximity of their hibernaculum. Based on the presence of hibernacula nearby and the presence of potential summer habitat in the watershed, utilization of the area by Indiana bats for summer range is possible. Summer habitat, used for foraging and roosting, is defined as riparian, bottomland or upland forest, old fields and pasture scattered with trees. Roost habitat primarily consists of exfoliating bark with space for bats to roost between the bark and the bole of the tree, such as would be found on dead trees or live species such as shagbark hickory. Tree cavities, crevices, splits, or hollow portions of tree boles and limbs also provide roost sites.

The endangered shale barren rock cress, *Arabis serotina,* is known to occur on some shale barrens in Hardy County. Shale barrens are areas of hard shaley rock of the Romney and Jennings formations that outcrop on steep hillsides, usually greater than 20 degrees. These areas have sparse soil, limited available moisture, rock consisting of quartz and clay minerals, and limited nutrients. The peculiarities of the shale slopes lead to the occurrence of endemic plants such as the shale barren rock cress.

Wetlands

The National Wetland Inventory (NWI) has documented 178 wetlands in the Mudlick Watershed. Most of the wetland areas are an acre or less. Approximately 10 wetland sites are between 1-5 acres in size. A large number of the wetland are classified as Palustrine permanently flood from dikes or impoundment and have an unconsolidated bottom. The larger wetland areas are classified as Palustrine temporarily flooded with persistent emergence of water. Additionally, the following are classified as Riverine-Upper Perennial, permanently flooded with an unconsolidated bottom. The Riverine system is found in the following areas: (1) Mudlick Run from where it is joins Anderson

Run up to an elevation of 880 feet. (2) Anderson Run from an elevation of 920 feet to where it joins Mudlick Run. The approximate range of the total area covered by wetlands in the entire watershed is 200-250 acres.

Riparian Areas

All of the headwaters of the watershed are completely forested due to high elevation. Pasture land has very few buffers installed. Livestock have full access to the stream at all times. Mudlick Run north of Anderson Run has an approximate forest buffer of 25' - 30'. This area is also the largest corn based cropland in the watershed. Approximately 65% of the producers with cropland have maintained vegetative cover either in the form of grass or trees between cropland and waterways.

Water Quality

The 305 Clean Water Act report shows 7 test sites in the Mudlick Watershed. Of these 7 sites, 5 were collected by WV-DEP Watershed Assessment, 1 collected by the WV-DEP Legacy, and 1 collected by the U.S. Geologic Survey. Each major tributary was tested. Three tests were performed on Anderson Run, 2 test on Mudlick Run, and 1 test each on Walnut Bottom (major tributary of Anderson Run) and Turnmill Run.

Anderson Run was placed on the WV 303(d) list of impaired streams by WVDEP due to elevated levels of fecal coliform bacteria. Human health is listed as the use affected by the pollutant. On Mudlick Run the aquatic life is listed as affected by an unknown pollutant from an undetermined source. Ground water quality can not be assessed at this time because no current data exist on this subject.

Cultural Resources

This watershed contains numerous cultural resources including at least six (6) known prehistoric archaeology sites and a number of historic properties listed on or eligible for listing on the National Register of Historic Places. These sites include portions of the Middle South Branch Valley Historic District, and the Northern area of Moorefield Battle Field.

More prehistoric and historic sites are most likely present but have yet to be discovered. Any future development needs to assess its potential impacts to any cultural resources that may be present, whether these are known or unknown resources.

Flood Damages

Floodplain soils are present along the major tributaries of the watershed. The soil types include Lindside & Lobdell, Huntington, Tioga, Potomac, Chagrin, and Melvin. These soils are prone to flash-flooding as a result of heavy rainfall in any season, or severe thunderstorms in summer. The soils in the floodplains are suited for cultivated crops, pasture, and hay. They also have high productivity potential for trees, but very few acres are wooded.

The floodplain is designated by FEMA as Zone A for Anderson Run and Mudlick Run with no base flow elevations determined for a 100 year flood frequency. Anderson Run's Zone A determination runs 8600 linear feet from where it joins Mudlick Run. Zone A determination for Mudlick Run starting at the South Branch of the Potomac convergence until County Route 220/1. All other tributaries have no floodplain determinations.

Streambank Erosion

Streambank erosion is not a major environmental concern in the Mudlick watershed, although some streambank degradation is occurring in pastureland areas where livestock have direct, continuous access. Fencing, alternative water sources, and improved livestock crossings are needed to protect streambanks and riparian vegetation on portions of the main tributaries in the watershed.

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